Marco Panizza

Full professor

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Education and training

1997
Degree Chemical Engineering
Electrode materials for the application of electrochemical technologies in the purification of industrial wastewater - 110/110 cum laude
University of Genoa - Genoa - IT

2001
PhD in Chemistry for Engineering
Electrochemical oxidation of organic substances for the treatment of industrial effluents
University of Genoa - Genoa - IT

Academic experience

2001 - 2005
Post-doc at the University of Genoa
University of Genoa - Genoa - IT

2005 - 2014
Researcher
University of Genoa - Genoa - IT

2014 - ONGOING
Professor
University of Genoa - Genoa - IT

Language skills

English

Research interests

The writer conducts its research in the Laboratory of Electrochemistry and Corrosion of Metallic Materials DICCA of the University of Genoa in the fields of electrochemical technologies for the protection and preservation of the environment.
The research topics addressed can be identified with the following breakdown:
(i) Electrochemical Advanced Oxidation Processes: In this field research

conducted by the candidate is mainly aimed to evaluate the electrocatalytic properties of different electrode materials both traditional (platinum, Dimensionally Stable Anodes, lead dioxide) and innovative (anodes doped diamond boron, gas diffusion cathodes) for the electrochemical treatment of effluents containing toxic organic compounds. In particular, they have been effectively treated many synthetic solutions containing aromatic compounds (phenol, naphthol, chloro phenol, herbicides, dyes, etc..) and real effluents from chemical industries, landfill and olive oil mills.

(ii) Removal and recovery of metal ions from industrial waste: the electrochemical techniques offer promising solutions for the treatment of effluent containing metal ions because, besides a high efficiency, allow to recover the pure metal, without formation of sludge from having to dispose. This research concerned the optimization of electrode configurations (planar or three-dimensional) and electrochemical reactors recirculating (or single step) for the recovery of metal ions from industrial effluents.

(iii) Formulation of mathematical models for the electrochemical oxidation of organic pollutants: theoretical models have been developed, validated by experimental data, to predict the evolution of the organic load and efficiency of current during the electrochemical treatment of organic pollutants. These models also make it possible to estimate the specific energy consumption and can be used as a tool for the calculation of the electrode needed at the design of electrochemical reactors.

(iv) Study of electrolytes and electrode materials for high temperature fuel cells: in the field of high temperature fuel cells they were studied, using electrochemical techniques, the electrode processes that occur in solid oxide cells (SOFC) and Molten Carbonate (MCFC), the composition of the cathode materials for SOFC and different electrolytes with protonic and anionic conductivity. The obtained data permitted to realize both single anode supported fuel cell and cell stack.

The techniques used in the development of these topics were primarily electrochemical (Cyclic voltammetry, anodic and cathodic polarization, chronoamperometries, galvanostatic electrolysis, Electrochemical Impedance Spectroscopy EIS) together with chemical analysis (analysis of Chemical Oxygen Demand, Total Organic Carbon, HPLC , gas chromatography, UV-visible, IR, titrations, etc..)